

enveloping membrane. In many *Aphides* these Amœboid corpuscles undergo a further degree of evolution by their transformation into small unequal bacilli, which are straight or diversely flexuose, immobile and colourless, and 0.005–0.020 millim. in length. We might easily be led to regard them as a parasitic vegetable production, if we had not before our eyes all the successive phases of the transformation of these elements. Moreover their rapid solubility in alkaline solutions constitutes a character which differentiates them completely from the microscopic *Oscillatoria*, with which they present the greatest resemblance. Several times I have succeeded in seeing some of these corpuscles in the ovarian tubes, or forming small groups at the bottom of the terminal chamber of the ovigerous sheaths.

In the third and last part of this memoir I shall investigate the phenomena of reproduction in the oviparous *Aphides*, and show how these are related to the viviparous generations which preceded them.

MISCELLANEOUS.

On the Metamorphoses of the Marine Crustacea.

By M. Z. GERBE.

THE author gives the following summary of the conclusions to which his investigations have led him:—

1. The larvæ of the species belonging to the genera *Maia*, *Pisa*, *Platycarcinus*, *Cancer*, *Xantus*, *Gonoplax*, *Portunus*, *Porcellana*, *Palinurus*, *Homarus*, *Callinassa*, *Crangon*, *Athanas*, *Palæmon*, *Mysis*, *Ione*, and very probably those of many other genera, undergo, immediately after their birth, a first moult, which gives them a form different from that which they possessed in the egg.

2. None of the marine Crustacea of the division Podophthalma, or of the Edriophthalma, which I have observed has its organization complete at birth or possesses forms by which it might be referred to the species to which it belongs, and all are furnished with transitory appendages for natation, which give them a locomotion different from that which they will have in the perfect state: these appendages persist until the fifth or sixth moult, and become atrophied in position without falling off.

3. It is only at the fifth moult in some, and at the sixth in others, and after having undergone modifications at each moult, that the general form of the adult and the external organs are complete. To these transitory external forms, so different from those of the perfect animals, and becoming modified at each moult, are due a multitude of false species and genera and doubtful families*, and even, as regards the larvæ of the *Palinuri*, an entire order to be eliminated.

* The family of the Erichthidæ, in the order Stomapoda, appears to me to be chiefly founded upon Crustacea in the larval state.

4. However the larvæ of various species of Crustacea may resemble each other in external form, nevertheless in the arrangement, the form, and the number of the spots of the skin and intestine, and especially in the number and conformation of the provisional appendages which adorn the extremity of the last segment of the abdomen, they present definite characters which enable us to say to what species any particular larva belongs.

5. The stomach of the larvæ of the marine Crustacea presents no solid piece adapted to the grinding of food; it is merely furnished on its inner face with rigid *spinules* arranged in rows, and with vibratile cilia like those found in the stomachs of a great number of the lower animals. These cilia communicate an incessant movement of rotation to the organic molecules upon which the animal feeds.

6. In all larvæ of Crustacea, the liver, at first reduced to two simple cæca, one on each side, is manifestly a diverticulum of the intestinal tube, with which it has wide communications; by ramifying, it forms a hollow tree, at the base of which we may see oscillating the vitelline globules which the umbilical vesicle pours into the pyloric portion of the intestine.

7. The marine Crustacea, however the respiratory functions may be ultimately performed, all have a tegumentary respiration in the larval state.

With the exception of the Lobsters, which, when first hatched, have a rudimentary branchial apparatus quite unfit to perform any functions, the larvæ of the other genera of Crustacea enumerated above are absolutely destitute of this apparatus; some, indeed, do not present any traces of it until after several moults.

8. The want of the function of branchial respiration necessitates a radical difference between the circulation of the individual in the larval and the individual in the perfect form—that is to say, having acquired branchiæ. In all the larvæ of *Maia*, *Porcellana*, *Crangon*, *Palæmon*, *Palinurus*, *Homarus*, *Cancer*, &c., the blood which the arteries have distributed to the different parts of the body returns *entirely, directly to the heart*, and this condition persists for a considerable time. It is only after the third moult, in the most perfect larva of the species inhabiting our seas—that of the Lobster—that a few globules are diverted from the original general circulation to penetrate into the nascent branchiæ.

9. All the arteries open directly into the venous passages by an aperture more or less bevelled and more or less dilated into a trumpet-like form.

10. In some larvæ the abdominal artery may present a sort of sphincter in its course, at some distance from the central organ of circulation; this, by contracting, temporarily suspends the flow of blood to the hinder parts*.

* This remarkable peculiarity exists not only in the larvæ of the Lobsters, as already indicated, but also in those of the *Porcellanæ*. It is even probable that it will be found in many species, and perhaps in all; for when we observe the circulation in the last segment of the abdomen of larvæ of *Cancer*, *Carcinus*, *Palæmon*, &c., interruptions are perceived in it.

11. Although the transitory spines which arm the thorax of some species do not receive any arterial branch, a complete circulation is established in their cavity. Some of the globules which the venous lacunæ convey to the heart make a digression into these transitory appendages, traverse nearly their whole length, and return by a parallel course into the lacuna from which they started.

12. The central nervous system of the larvæ of Crustacea presents differences in its arrangement and form from that of the perfect individual; and the development of each of the medullary nuclei which constitute the ganglionic masses is in relation to the development of the organs to which these nuclei correspond.

13. Lastly, no larva of any species of Crustacea presents traces of the generative apparatus.—*Comptes Rendus*, May 7, 1866, pp. 1024–1027.

On the Mi-lou or Sseu-pou-siang, a Mammal from the north of China, which forms a new Section in the Family Cervidæ. By A. MILNE-EDWARDS.

Father David, a missionary at Peking, has sent to the Museum at Paris a zoological collection containing skins of the *Mi-lou*, a large species of stag, which is regarded by M. A. Milne-Edwards as a completely new form.

In its general aspect, in its coat, its clumsy gestures, and the mode in which the male carries his horns, it has a certain resemblance to the Reindeer. It approaches the true *Cervi* by the possession of a naked muffle and in the anatomical characters of the skull; but it is distinguished from all known Cervidæ by the direction and mode of ramification of the horns, and also by the structure of the tail.

The horns present no basal anterior antler, but they are greatly developed and much branched. The processes of the frontal bone from which they originate are larger than in the common stag. The beam is thick, and, at a considerable distance above the burr, gives origin to a long posterior branch, which is directed almost horizontally backward, so as nearly to touch the back of the animal; this branch is almost as thick as the *perche*, and bears on its subterminal portion several antlers arranged upon its outer margin and very close together, so as to form a sort of palmation slightly resembling that of the brow-antler of old reindeers. The *perche*, instead of being regularly curved, is twisted into an S-like form, and bears two large antlers directed backwards and inwards; it terminates in a fork; lastly, all the upper part of the horn is armed with a series of large tubercles, several of which are so much developed as to form little accessory antlers on the outer margin. The female has no horns.

The coat of these animals is rough, brittle, very thick, and of a uniform yellowish-grey colour, except on the median line of the back and chest, where there is a black band.

The tail, instead of being short and thick, is very long, and fur-